

REMARKS

This is intended as a full and complete response to the Final Office Action dated July 6, 2007 having a shortened statutory period for response set to expire on October 8, 2007. Claim 1 has been amended to more clearly recite various aspects of the invention. Claims 23-24 have been amended to change their claim dependencies. Applicants believe no new matter has been introduced by the amendments presented herein. The amendments have been made in a good faith effort to advance prosecution on the merits and to put the claims in condition for allowance or to put the claims in better condition for an appeal. Please reconsider the claims pending in the application for reasons discussed below. Claim 28 has been cancelled without prejudice. Applicants reserve the right to subsequently take up prosecution of the claims as originally filed in this application in a continuation, a continuation-in-part and/or a divisional application. Please reconsider the claims pending in the application for reasons discussed below.

Figure 6 is objected to for lacking a PRIOR ART legend in view of "Deepwater Geohazard Analysis Using Prestack Inversion" by de Kok et al., SEG September 2001 Expanded Abstracts ("de Kok"). Figures 7-8 are objected to for lacking a PRIOR ART legend in view of Prestack Waveform Inversion Using A Genetic Algorithm – The Present And The Future by S. Mallick, CSEG Recorder (June 2001) ("Mallick 2001"). Applicants respectfully traverse this objection.

Applicants respectfully submit that neither de Kok nor Mallick 2001 is a proper 102 reference. "For 35 U.S.C. 102(a) to apply, the reference must have a publication date earlier in time than the effective filing date of the application, and must not be applicant's own work." MPEP 706.02(a)(II)(C). In this case, de Kok is coauthored by both inventors of the present application. Mallick 2001 is authored by an inventor of the present application. Accordingly, both de Kok and Mallick 2001 are Applicants' own work. Further, the Examiner has agreed during a telephone interview on September 6, 2006 that neither de Kok nor Mallick 2001 is a proper 102 reference. Applicants respectfully submit therefore that Figures 6-8 do not require the PRIOR ART legend

since they do not illustrate prior art. Withdrawal of the objection is respectfully requested.

Claims 1-5 and 7-28 stand rejected under 35 USC 102(a) as being anticipated by de Kok. Applicants respectfully traverse this rejection. MPEP 706.02(a)(II)(C) specifically states that for “35 U.S.C. 102(a) to apply, the reference must have a publication date earlier in time than the effective filing date of the application, and must not be applicant's own work.” In this case, de Kok is coauthored by both inventors of the present application. As such, de Kok is Applicants' own work and is therefore not a proper 102 reference.

Claim 1 has been significantly amended to include the limitations of claims 23-24, which have now been cancelled without prejudice. That is, claim 1 now includes the limitation “applying a post-stack inversion on the seismic data using the elastic model to determine the shallow water flow risk over a 3D volume, wherein the post-stack inversion is performed using an AVO intercept and a pseudo shear-wave data volume.” For that reason, even if de Kok were a proper 102 reference, de Kok still fails to teach or disclose applying a post-stack inversion on the seismic data using the elastic model to determine the shallow water flow risk over a 3D volume, wherein the post-stack inversion is performed using an AVO intercept and a pseudo shear-wave data volume, as recited in amended claim 1. Accordingly, claim 1 is patentable over de Kok. Claims 2-5, 7-22 and 25 are also patentable over de Kok since they depend from claim 1. Withdrawal of the rejection is respectfully requested.

Likewise, Applicants submit that even if de Kok were a proper 102 reference, de Kok still fails to teach or disclose applying a post-stack inversion on the seismic data using the elastic model, as recited in claim 26. Claim 26 is therefore patentable over de Kok. Claims 23-24 and 27 are also patentable over de Kok since they depend from claim 26. Claim 28 has been cancelled without prejudice, thereby rendering the rejection moot with respect to that claim. Withdrawal of the rejection is respectfully requested.

Claims 1-5 and 7-27 stand rejected under 35 USC 102(a) as being anticipated by The Petrophysical Basis For Shallow-Water Flow Prediction Using Multicomponent Seismic Data by A. Huffman and J. Castagna (The Leading Edge September 2001)

("H1"). Claim 1 has been significantly amended to include the limitations from claims 23-24, which have now been cancelled without prejudice. That is, claim 1 now includes the limitation "applying a post-stack inversion on the seismic data using the elastic model to determine the shallow water flow risk over a 3D volume, wherein the post-stack inversion is performed using an AVO intercept and a pseudo shear-wave data volume." Applicants respectfully submit that H1 does not teach or disclose applying a post-stack inversion on the seismic data using the elastic model to determine the shallow water flow risk over a 3D volume, wherein the post-stack inversion is performed using an AVO intercept and a pseudo shear-wave data volume, as recited in amended claim 1. Accordingly, Applicants respectfully submit that claim 1 is now patentable over H1. Claims 2-5, 7-22 and 25 are also patentable over H1 since they depend from claim 1. Withdrawal of the rejection is respectfully requested.

Likewise, Applicants submit that H1 fails to teach or disclose applying a post-stack inversion on the seismic data using the elastic model, as recited in claim 26. Claim 26 is therefore patentable over H1. Claims 23-24 and 27 are also patentable over H1 since they depend from claim 26. Claim 28 has been cancelled without prejudice, thereby rendering the rejection moot with respect to that claim. Withdrawal of the rejection is respectfully requested.

Claims 1-5 and 7-28 stand rejected under 35 USC 102(e) as being anticipated by US Patent No. 6,694,261 ("H2"). Claim 1 has been significantly amended to include the limitations from claims 23-24, which have now been cancelled without prejudice. That is, claim 1 now includes the limitation "applying a post-stack inversion on the seismic data using the elastic model to determine the shallow water flow risk over a 3D volume, wherein the post-stack inversion is performed using an AVO intercept and a pseudo shear-wave data volume." Applicants respectfully submit that H2 does not teach or disclose applying a post-stack inversion on the seismic data using the elastic model to determine the shallow water flow risk over a 3D volume, wherein the post-stack inversion is performed using an AVO intercept and a pseudo shear-wave data volume, as recited in amended claim 1. Accordingly, Applicants respectfully submit that claim 1 is now patentable over H1. Claims 2-5, 7-22 and 25 are also patentable over H2 since they depend from claim 1. Withdrawal of the rejection is respectfully requested.

Likewise, Applicants submit that H2 fails to teach or disclose applying a post-stack inversion on the seismic data using the elastic model, as recited in claim 26. Claim 26 is therefore patentable over H2. Claims 23-24 and 27 are also patentable over H2 since they depend from claim 26. Claim 28 has been cancelled without prejudice, thereby rendering the rejection moot with respect to that claim. Withdrawal of the rejection is respectfully requested.

Claims 1-5 and 7-28 stand rejected under 35 USC 103(a) as being unpatentable over *Some Practical Aspects Of Prestack Waveform Inversion Using A Genetic Algorithm: An Example From The East Texas Woodbine Gas Sand* by S. Mallick, Geophysics, Vol. 64, No. 2, pages 326-336 (March-April 1999) ("Mallick 1999") in view of H2.

Claim 1 has been significantly amended to include the limitations from claims 23-24, which have now been cancelled without prejudice. That is, claim 1 now includes the limitation "applying a post-stack inversion on the seismic data using the elastic model to determine the shallow water flow risk over a 3D volume, wherein the post-stack inversion is performed using an AVO intercept and a pseudo shear-wave data volume."

Neither Mallick 1999 nor H2, alone or in combination, teaches or discloses applying a post-stack inversion on the seismic data using the elastic model to determine the shallow water flow risk over a 3D volume, wherein the post-stack inversion is performed using an AVO intercept and a pseudo shear-wave data volume, as recited in amended claim 1. Furthermore, there is no "apparent reason to combine the known elements in the fashion" recited in claims 5, 18, 30 and 35. *KSR Int'l v. Teleflex, Inc.*, 127 S. Ct. 1727 (2007). "To facilitate review, this analysis should be made explicit ... Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *Id.* Accordingly, Applicants respectfully submit that claim 1 is now patentable over Mallick 1999 in view of H2. Claims 2-5, 7-22 and 25 are also patentable over Mallick 1999 in view of H2, since they depend from claim 1. Withdrawal of the rejection is respectfully requested.

Likewise, neither Mallick 1999 nor H2, alone or in combination, teaches or discloses applying a post-stack inversion on the seismic data using the elastic model,

as recited in claim 26. Furthermore, there is no “apparent reason to combine the known elements in the fashion” recited in claims 5, 18, 30 and 35. *KSR Int’l v. Teleflex, Inc.*, 127 S. Ct. 1727 (2007). “To facilitate review, this analysis should be made explicit ... Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.* Accordingly, Applicants respectfully submit that claim 26 is patentable over Mallick 1999 in view of H2. Claims 23-24 and 27 are also patentable over Mallick 1999 in view of H2, since they depend from claim 26. Withdrawal of the rejection is respectfully requested.

Claim 6 stands rejected under 35 USC 103(a) as being unpatentable over Mallick 1999 in view of H2 and Kirchhoff Imaging As A Tool For AVO/AVA Analysis by Tygel et al., The Leading Edge (August 1999) (“Tygel”).

Neither Mallick 1999 nor H2 nor Tygel, alone or in combination, teaches or discloses applying a post-stack inversion on the seismic data using the elastic model to determine the shallow water flow risk over a 3D volume, wherein the post-stack inversion is performed using an AVO intercept and a pseudo shear-wave data volume, as recited in amended claim 1. Furthermore, there is no “apparent reason to combine the known elements in the fashion” recited in claims 5, 18, 30 and 35. *KSR Int’l v. Teleflex, Inc.*, 127 S. Ct. 1727 (2007). “To facilitate review, this analysis should be made explicit ... Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.* Since claim 6 depends from claim 1 and since neither Mallick 1999 nor H2 nor Tygel, alone or in combination, teaches, discloses or suggests all the limitations of claim 1, claim 6 is therefore also patentable over Mallick 1999, H2 and Tygel. Accordingly, withdrawal of the rejection is respectfully requested.

Claim 6 stands rejected under 35 USC 103(a) as being unpatentable over de Kok in view of Tygel. As mentioned above, MPEP 706.02(a)(II)(C) specifically states that for “35 U.S.C. 102(a) to apply, the reference must have a publication date earlier in time than the effective filing date of the application, and must not be applicant's own work.” In this case, de Kok is coauthored by both inventors of the present application. As

such, de Kok is Applicants' own work and is therefore not a proper 102 reference. Further, even if de Kok were a proper 102 reference, de Kok still fails to teach or disclose applying a post-stack inversion on the seismic data using the elastic model to determine the shallow water flow risk over a 3D volume, wherein the post-stack inversion is performed using an AVO intercept and a pseudo shear-wave data volume, as recited in amended claim 1. Likewise, Tygel also fails to teach or disclose applying a post-stack inversion on the seismic data using the elastic model to determine the shallow water flow risk over a 3D volume, wherein the post-stack inversion is performed using an AVO intercept and a pseudo shear-wave data volume, as recited in amended claim 1. Furthermore, there is no "apparent reason to combine the known elements in the fashion" recited in claims 5, 18, 30 and 35. *KSR Int'l v. Teleflex, Inc.*, 127 S. Ct. 1727 (2007). "To facilitate review, this analysis should be made explicit ... Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *Id.* Since claim 6 depends from claim 1 and claim 1 is patentable over de Kok and Tygel, claim 6 is also patentable over de Kok and Tygel. Withdrawal of the rejection is respectfully requested.

In conclusion, the references cited by the Examiner, neither alone nor in combination, teach, show, or suggest the claimed invention. Having addressed all issues set out in the office action, Applicants respectfully submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,

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